

**KEY**

- BRITISH GAS MAIN
- NORTHERN ELECTRIC/NWL HV
- SEWER
- TELECOM CABLE
- CHEMICAL PIPELINE
- NWL WATER MAIN
- COMPRESSED AIR
- CULVERT
- DRAIN
- DUCTS
- LIGHTING CABLE
- U/G ELECTRIC CABLE
- SCREEN BYPASS
- GAS SCRUBBING
- SEWER RISING MAIN
- SLUDGE MAIN
- HIGH PRESSURE WATER
- WATER RISING MAIN
- WASH WATER MAIN
- WATER
- LIGHTING COLUMN WITH 150W SON
- TWIN 750W FLOODLIGHTS
- EXISTING FENCE LINES
- FIRE HYDRANTS
- ELECTRICAL
- CHEMICAL

	APPROVED	07/15		G.G.
V1	NWL CAD	10/14	CL	
REV	DESCRIPTION	DATE	DRAWN	CHK'D

**NOTE:**  
 IF THIS DRAWING IS FOUND TO BE ANY WAY  
 INNACCURATE, PLEASE ADVISE THE ASSET  
 SYSTEMS RECORDS OFFICE IMMEDIATELY AND  
 COMPLETE AN AMENDMENT FORM



CONTRACTOR  
 REF. No.  
 I.D. PROJECT No.

DRAWING TITLE  
 HOWDON STW  
 DRAINAGE  
 RED FILE

NWL, REF. HOWDON-HR-V1			SCALE:- NTS
SHEET 4 of 6	DATE 23/10/14	SHEET SIZE A1	REV. No. V1

- Unless noted otherwise, all levels are in metres above Ordnance Datum (AOD) and all dimensions are in millimetres.
- Unless noted otherwise all underground drainage to be Polypropylene Rigid/ductile iron or equivalent.
- Kerbs and channels to have level invert unless noted otherwise and to be installed in strict accordance with the manufacturer's recommendations.
- Cover levels shown may be subject to revision to match finished levels during construction.

FOR DRAINAGE AND DUCT LOCATIONS  
REFER TO DRAWING NUMBERS:  
P700-2-00-009, 010, 031 AND 032

**Key**

- Kerbside kerb drain
- Channel
- Surface water sewer and manhole
- Foul water sewer and manhole
- Foul water sewer and polypropylene inspection chamber
- Filter drain NWL SDD 6/39 and catchpit
- Concrete road gully NWL SDD 6/36
- Clay footpath gully NWL SDD 6/36
- Rodding eye

Note:  
All RWP locations TBC subject to final design

**AS BUILT**  
Date: 22/05/12  
As-built drawing prepared by Mott MacDonald based on information provided by GTM JV. Mott MacDonald accepts no liability for the accuracy or completeness of this drawing.

AB	As Built Issue	22.05.12
Rev	Revision details	Drn Chk App Date

Northumbrian Water Ltd.  
Abbey Road  
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Mott MacDonald Document No	MMD-287139-C-DR-00-XX-1059	Rev.	AB
Intech Document No	P700-2-00-009	Rev.	X00

Customer: NORTHUMBRIAN WATER LTD

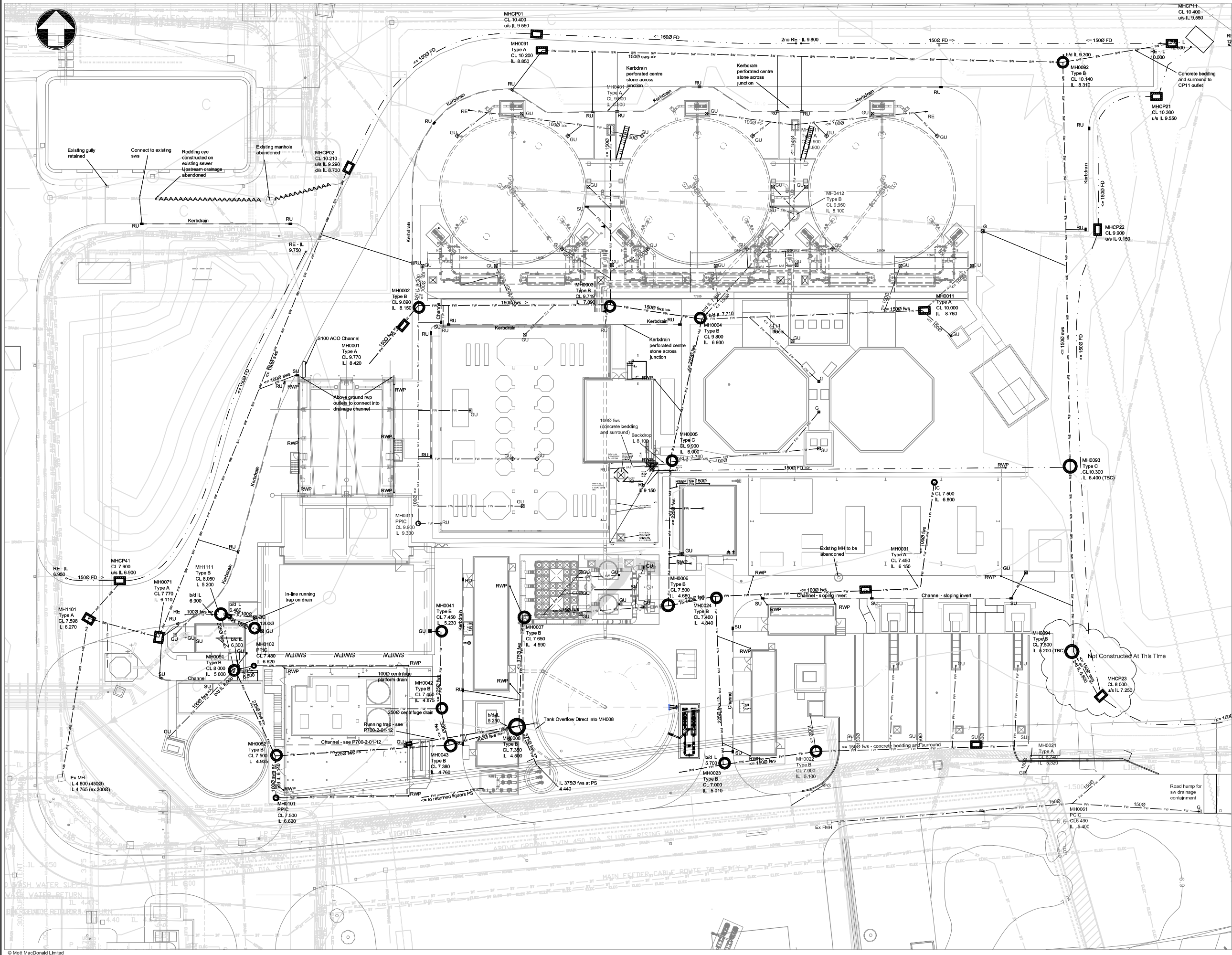
Project: HOWDON STW  
HOWDON ADVANCED DIGESTION

Title: Proposed Site Layout  
Drainage Layout  
Sheet 1 of 2

Drawn by:	XXX DD/MM/YY	Checked:	XXX DD/MM/YY	Scale:	1:250
Designed:	XXX DD/MM/YY	Approved:	XXX DD/MM/YY		

NWL DRL No	18633-800-DOC-CST-G04-001	Rev.	01
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**Foul Manhole Schedule**

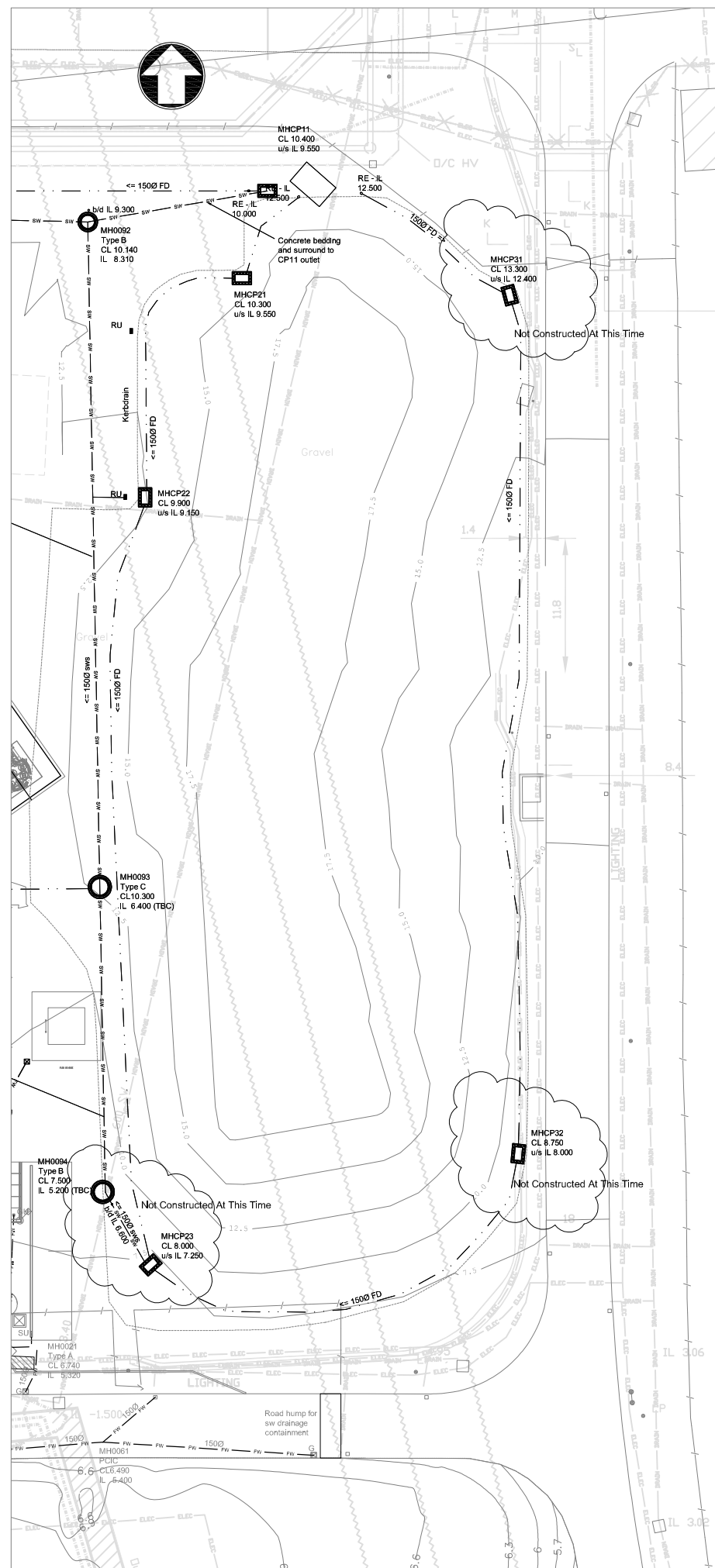
Manhole Ref.	Manhole Co-ordinates	Plan	Cover Level (m AOD)	Invert Level (m) (AOD)	Depth to Soffit (m)	Pipe Diameters (mm)	Chamber type & size (mm)	Comments
0001	E 433555.75 N 566365.06		9.770	A - 8.425 B - 8.425 X - 8.420	A - 1.190 B - 1.190 X - 1.200	A - 150 B - 150 X - 150	Type A NWL SDD 1/31 1200x675	Class E600 cover and frame
0002	E 433563.27 N 566373.58		9.890	A - 8.200 B - 8.160 C - 9.000 b/d X - 8.150	A - 1.590 B - 1.580 C - 0.790 X - 1.590	A - 100 B - 150 C - 100 X - 150	Type B NWL SDD 1/32 1200Ø	Class E600 cover and frame
0003	E 433590.88 N 566373.74		9.719	A - 8.200 b/d B - 8.160 C - 7.900 D - 1.869 X - 7.890	A - 0.419 B - 0.419 C - 1.669 D - 1.50 X - 1.679	A - 100 (RU) B - 100 (RU) C - 150 D - 150 X - 150	Type B NWL SDD 1/32 1200Ø	Class E600 cover and frame
0004	E 433603.86 N 566372.14		9.800	A - 7.005 B - 7.950 b/d C - 7.710 b/d X - 6.930	A - 2.645 B - 1.700 C - 1.940 X - 2.645	A - 150 B - 150 C - 150 X - 225	Type B NWL SDD 1/32 1200Ø	-
0005	E 433599.51 N 566351.59		9.900	A - 7.900 b/d B - 6.005 C - 7.760 b/d X - 6.000	A - 1.900 B - 3.670 C - 2.040 X - 3.675	A - 100 B - 225 C - 100 X - 225	Type C NWL SDD 1/33 1200Ø	-
0006	E 433599.01 N 566330.83		7.500	A - 4.830 B - 4.830 X - 4.880	A - 2.145 B - 2.145 X - 2.145	A - 225 B - 225 X - 375	Type B NWL SDD 1/32 1350Ø	-
0007	E 433578.41 N 566329.11		7.850	A - 5.150 B - 4.595 X - 4.590	A - 2.400 B - 2.680 X - 2.685	A - TBC (rwp) B - 375 X - 375	Type B NWL SDD 1/32 1350Ø	-
0008	E 433577.33 N 566313.41		7.350	A - 4.575 B - 5.250 b/d C - 4.505 D - 4.725 X - 4.500	A - 2.475 B - 1.950 C - 2.470 D - 2.475 X - 2.475	A - 300 B - 150 C - 375 D - 150 X - 375	Type B NWL SDD 1/32 1800Ø	-
0011	E 433635.70 N 566373.14		10.000	A - 8.810 B - 8.810 X - 8.760	A - 1.090 B - 1.090 X - 1.090	A - 100 (SU) B - 100 X - 150	Type A NWL SDD 1/31 1200x675	-
0021	E 433651.15 N 566310.68		6.740	A - 5.330 B - 5.330 X - 5.320	A - 1.260 B - 1.260 X - 1.270	A - 150 (SU) B - 150 X - 150	Type A NWL SDD 1/31 1200x675	-
0022	E 433620.25 N 566309.86		7.000	A - TBC B - 5.110 X - 5.100	A - TBC B - 1.740 X - 1.750	A - 100 B - 150 X - 150	Type B NWL SDD 1/32 1200Ø	-
0023	E 433607.12 N 566308.20		7.000	A - 5.010 B - 5.700 b/d X - 4.935	A - 1.840 B - 1.200 X - 1.840	A - 150 B - 100 (TBC) X - 225	Type B NWL SDD 1/32 1200Ø	-
0024	E 433605.95 N 566331.81		7.460	A - 5.020 B - 4.864 X - 4.840	A - 2.390 B - 2.340 X - 2.395	A - 100 B - 225 X - 225	Type B NWL SDD 1/32 1200Ø	Class E600 cover and frame
0031	E 433635.28 N 566333.26		7.450	A - 6.160 B - 6.150 X - 6.150	A - 1.190 B - 1.200 X - 1.200	A - 100 B - 100 X - 100	Type A NWL SDD 1/31 1200x675	Class E600 cover and frame
0041	E 433566.52 N 566327.12		7.450	A - 5.235 B - 5.230 X - 5.230	A - 2.170 B - 2.175 X - 2.175	A - 225 B - 225 X - 225	Type B NWL SDD 1/32 1200Ø	Class E600 cover and frame
0042	E 433566.85 N 566316.07		7.450	A - 4.950 B - 4.950 X - 4.875	A - 2.225 B - 2.275 X - 2.275	A - 250 (centrifuge) B - 225 X - 300	Type B NWL SDD 1/32 1350Ø	Bolt down Class E600 cover and frame
0043	E 433567.80 N 566310.72		7.380	A - 4.840 B - 4.765 X - 4.760	B - 2.315 C - 2.315 X - 2.320	B - 225 C - 300 X - 300	Type B NWL SDD 1/32 1350Ø	Bolt down Class E600 cover and frame
0051	E 433536.75 N 566321.50		8.000	A - 6.000 b/d B - 5.005 C - 6.300 b/d D - 6.500 b/d X - 5.000	A - 1.900 B - 2.870 C - 1.800 D - 1.400 X - 2.875	A - 100 (SU) B - 225 C - 100 (SU) D - 100 X - 225	Type B NWL SDD 1/32 1200Ø	Class E600 cover and frame
0052	E 433542.83 N 566309.33		7.500	A - 6.140 b/d B - 4.940 X - 4.935	A - 1.260 B - 2.435 X - 2.440	A - 100 B - 225 X - 225	Type B NWL SDD 1/32 1200Ø	-
0311	E 433563.15 N 566342.59		9.900	A - 9.330 B - 9.330 X - 9.330	A - 0.850 B - 0.850 X - 1.000	A - 100 B - 100 X - 100	PPIC 475Ø	THP Area
0401	E 433590.75 N 566399.04		9.900	A - 8.950 B - 8.950 X - 8.900	A - 0.850 B - 0.850 X - 0.850	A - 100 B - 100 X - 150	Type A NWL SDD 1/31 1200x675	Digester Area
0411	E 433617.29 N 566399.84		9.900	A - 8.950 B - 8.950 X - 8.900	A - 0.850 B - 0.850 X - 0.850	A - 100 B - 100 X - 150	Type A NWL SDD 1/31 1200x675	Digester Area
0412	E 433617.03 N 566386.78		9.800	A - TBC B - 8.150 X - 8.140	A - TBC B - 1.500 X - 1.500	A - 100 (g) B - 150 X - 150	Type B NWL SDD 1/32 1200Ø	Digester Area - Class E600 cover & frame
1111	E 433534.85 N 566329.57		8.050	A - 6.900 b/d B - 6.480 b/d C - 5.275 X - 5.200	A - 1.050 B - 1.470 C - 2.625 X - 2.625	A - 100 B - 100 (GU) C - 150 (GU) X - 225	Type B NWL SDD 1/32 1350Ø	-

**Surface Water Manhole Schedule**

Manhole Ref.	Manhole Co-ordinates	Plan	Cover Level (m AOD)	Invert Level (m) (AOD)	Depth to Soffit (m)	Pipe Diameters (mm)	Chamber type & size (mm)	Comments
0071	E 433525.95 N 566326.24		7.770	A - 6.260 B - 6.410 C - 6.460 X - 6.110	A - 1.210 B - 1.210 C - 1.210 X - 1.210	A - 300 B - 150 C - 100 (RU) X - 450	Type A NWL SDD 1/31 1200x900	Class E600 cover and frame
0101	E 433542.75 N 566303.22		7.500	A - 6.620 B - 6.820 X - 6.620	A - 0.780 B - 0.780 X - 0.780	A - 100 (rwp) B - 100 (SU) X - 100	PPIC 475Ø	Dewatering Area
0102	E 433539.57 N 566322.17		7.480	A - 6.620 B - 6.620 X - 6.620	A - 0.760 B - 0.760 X - 0.760	A - 100 (rwp) B - 100 X - 100	PPIC 475Ø	Dewatering Area
0091	E 433582.913 N 566406.176		10.200	X - 9.380	X - 1.200	X - 150	Type B NWL SDD 1200Ø	-
0092	E 433639.791 N 566405.676		10.140	A - 8.320 B - 9.300 b/d X - 8.310	A - 1.670 B - 0.690 X - 1.680	A - 150 B - 150 X - 150	Type B NWL SDD 1/32 1200Ø	-
0093	E 433656.670 N 566350.790		10.300	A - 6.450 B - 6.410 C - 6.410 X - 6.400	A - 3.700 B - 3.690 C - 3.690 X - 3.700	A - 100 (rwp) B - 150 C - 150 X - 150	Type C NWL SDD 1/33 1350Ø	-
0094	E 433656.97 N 566324.20		7.500	A - 5.650 TBC B - 5.200 TBC C - 6.800 b/d X - 5.200 TBC	A - 1.700 B - 1.700 C - 0.750 X - 1.700	A - 150 B - 600 Ex C - 150 X - 600 Ex	Type B NWL SDD 1/32 1500Ø	Constructed on existing 600Ø live sewer
1101	E 433515.884 N 566328.895		7.598	A - 6.280 B - 6.420 C - 6.420 X - 6.270	A - 1.200 B - 1.210 C - 1.210 X - 1.210	A - 300 (FE) B - 150 (G) C - 150 X - 300	Type A NWL SDD 1/31 1200x750	Class E600 cover and frame

**Catchpit Schedule**

Manhole Ref.	Manhole Co-ordinates	Plan	Cover Level (m AOD)	Invert Level (m) (AOD)	Depth to Soffit (m)	Pipe Diameters (mm)	Chamber type & size (mm)	Comments
CP01	E 433580.16 N 566413.13		10.400	A - 9.550 X - 9.525	A - 0.700 X - 0.725	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 9.225
CP02	E 433553.15 N 566393.63		10.210	A - 9.290 X - 8.730	A - 0.770 X - 1.330	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 8.430
CP11	E 433655.86 N 566411.45		10.400	A - 9.550 B - 9.550 X - 9.500	A - 0.700 B - 0.700 X - 0.750	A - 150 B - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 9.200
CP21	E 433669.04 N 566403.83		10.300	A - 9.550 X - 9.525	A - 0.600 X - 0.825	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 9.225
CP22	E 433660.65 N 566384.76		9.900	A - 9.150 X - 9.125	A - 0.800 X - 0.625	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 8.625
CP23	E 433661.13 N 566317.85		8.000	A - 7.250 B - 7.250 X - 7.225	A - 0.600 B - 0.600 X - 0.825	A - 150 B - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 6.925
CP31	E 433692.43 N 566402.39		13.300	A - 12.400 X - 12.375	A - 0.750 X - 0.775	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 12.075
CP32	E 433693.11 N 566327.46		8.750	A - 8.000 X - 7.975	A - 0.600 X - 0.825	A - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 7.675
CP41	E 433520.34 N 566334.38		7.900	A - 6.900 B - 6.900 X - 6.875	A - 0.850 B - 0.850 X - 0.875	A - 150 B - 150 X - 150	Catchpit NWL SDD 6/40 1200x675	Floor level 6.575



**General notes**

- Unless noted otherwise, all levels are in metres above Ordnance Datum (AOD) and all dimensions are in millimetres.
- Unless noted otherwise all underground drainage to be Polypipe Rigidrain/Ridgsewer or equal approved.
- Kerbstains and channels to have level invert unless noted otherwise and to be installed in strict accordance with the manufacturer's recommendations.
- Cover levels shown may be subject to revision to match finished levels during construction.

FOR DRAINAGE AND DUCT LOCATIONS REFER TO DRAWING NUMBERS: P700-2-00-001, 010, 031 AND 32

**Key**

- RU Kerbstain
- SU Channel
- MH Manhole
- FW Foul water sewer and manhole
- PPIC Foul water sewer and polypropylene inspection chamber
- MHCP Filter drain NWL SDD 6/39 and catchpit
- GU Concrete road gully NWL SDD 6/36
- RE Rodding eye

Note: All RWP locations TBC subject to final design

**AS BUILT**  
Date: 22/05/12

As-built drawing prepared by Mott MacDonald based on information provided by GTM JV. Mott MacDonald accept no liability for the accuracy or completeness of this drawing.

AB	As Built Issue				22.05.12
Rev	Revision details	Drn	Chk	App	Date

Mott MacDonald Document No: MMD-287139-C-DR-00-XX-1060

Imtech Document No: P700-2-00-010

Customer: NORTHUMBRIAN WATER LTD

Project: HOWDON STW  
HOWDON ADVANCED DIGESTION


Title: Proposed Site Layout  
Drainage Layout  
Sheet 2 of 2

Drawn by: XXX	DD/MM/YY	Checked: XXX	DD/MM/YY	Scale: 1:250
Designed: XXX	DD/MM/YY	Approved: XXX	DD/MM/YY	
NWL DRL No:				Rev.
18633-800-DOC-CST-G04-003				01

**NOT APPROVED**




1. Unless noted otherwise, all levels are in metres above Ordnance Datum (AOD) and all dimensions are in millimetres.
2. Do not scale from this drawing, use figured dimensions only.
3. Marshalls Mono S Ramp pcc units back to back across roads at three locations. Laid and sealed from kerb to kerb to contain contaminated surface water.
4. All foul drains within foul containment area drain back to return liquors pumping station.

Key  
 Foul water containment boundary



**AS BUILT**  
 Date: 09/01/13

As-built drawing prepared by Mott MacDonald based on information provided by GTM JV. Mott MacDonald accept no liability for the accuracy or completeness of this drawing.

AB	As Built	GRM	KW	KW	09.01.13
Rev	Revision details	Drn	Chk	App	Date

 Northumbrian Water Ltd.  
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 Durham  
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**GTM** GallifordTry  
  
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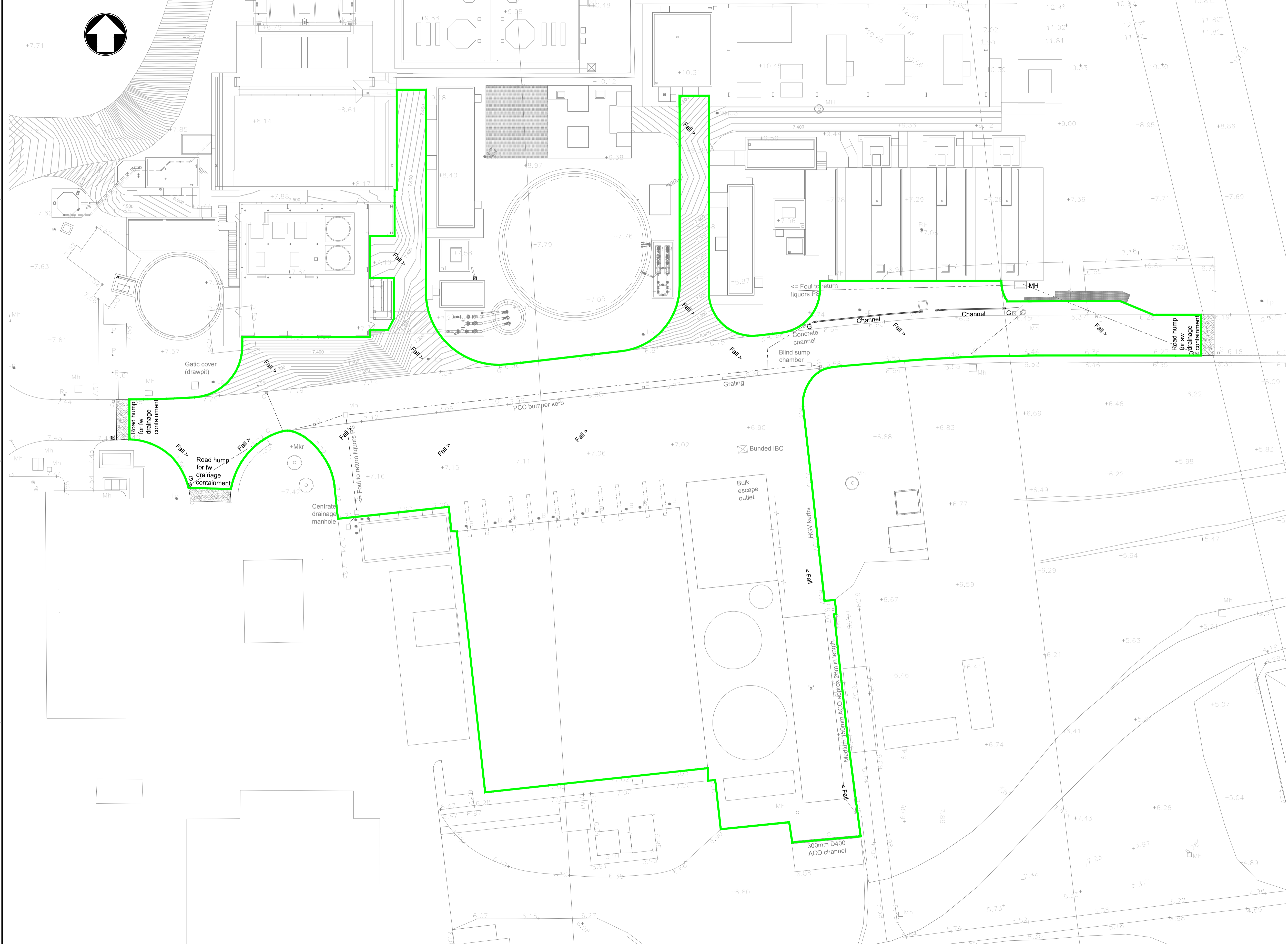
Mott MacDonald Document No	Rev.
MMD-287139-C-DR-00-XX-1073	AB
Imtech Document No	Rev.
P700-2-00-051	X00

Customer NORTHUMBRIAN WATER LTD  
 Project HOWDON STW  
 HOWDON ADVANCED DIGESTION

Title  
 Foul Drainage Modifications  
 Extent of Foul Water Containment

Drawn by:	Checked:	Scale
Designed:	Approved:	1:250
NWL DRL No	Rev.	
18633-800-DOC-SIN-B99-006	01	

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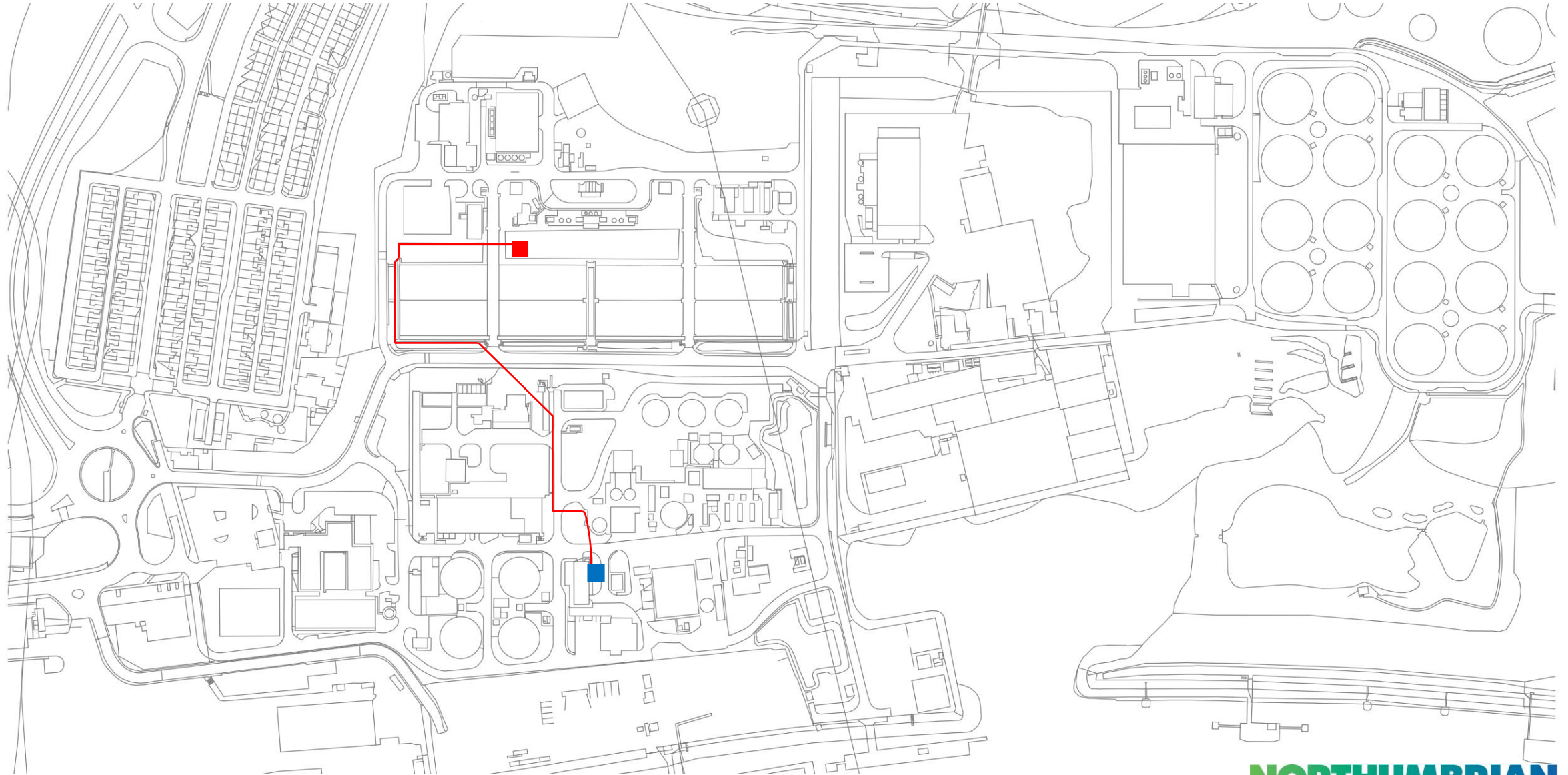


Plan  
 0 12.5m 25m  
 1:250

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# Howdon STW Sludge Liquor Returns General Arrangement



■ Emission point for the effluent discharge  
Grid Reference E:433467 N:566519

■ Effluent sampling point  
Grid Reference E:433523 N:566277